nice that you have 2 tables - one for raw + one for processed.

Table 1: This displays the raw and processed data compared to the grey scale that it was tested on. I have also included the average of each section to give an idea of the general trend.

Raw and Processed Data Comparing the Change in Grey Scale vs. Melted Water					
	Trials Conducted (ml)				
Grey Scale (%)	Trial 1	Trial 2	Trial 3	Trial 4	Average (ml)
0	0.7	0.5	0.8	0.9	0.7
25	0.5	0.4	0.8	0.5	0.6
50	0.7	0.3	0.6	0.3	0.5
75	0.5	1.1	0.2	0.6	0.6
100	0.8	0.9	0.7	0.5	0.7

Table 2: This only displays the grey scale vs. the average amount of water that was melted. This is the data table that is used in figure 1.

even for averages, show an example of worked problem.

Processed Data of Change in Grey scale vs. Melted Water	
Grey Scale (%)	Average (ml)
0	0.7
25	0.6
50	0.5
75	0.6
100	0.7

watch for "orphin" letters

Results: Raw Data: descriptive title

use headings more effectively.

	Tria l 1	Tria l 2	Tria l 3	Tria l 4	Tria l 5	Tria l 6	Tria l 7	Tria l 8	Tria l 9	Trial 10	Trial 11	Trial 12
0%	0.7	0.5	0.8	0.9	0.7	0.6	0.6	1.0	1.1	1.0	1.0	1.0
25 %	0.5	0.4	0.8	0.5	0.4	0.7	0.6	0.5	1.0	1.1	1.1	1.0
50 %	0.7	0.3	0.6	0.3	0.4	0.5	0.7	0.6	1.1	1.2	1.2	1.0
75 %	0.5	1.1	0.2	0.6	0.3	0.6	0.4	0.2	1.3	2.0	1.4	2.1
10 0%	0.8	0.9	0.7	0.5	0.7	0.4	0.7	0.7	2.0	2.0	1.9	2.1

Units?

good job on sig figs.

Results

Raw Data

More descriptive title please!

100% Black Paper		
Trials	Amount of Melted Ice	Average
1	0.2	0.175
2	0.2	
3	0.2	
4	0.1	

units!

75% Black Paper		
Trials	Amount of Melted Ice	Average
1	0.1	0.125
2	0.2	
3	0.1	
4	0.1	

Combine these tables into one.

50% Black Paper		
Trials	Amount of Melted Ice	Average
1	0.1	0.075
2	0.1	
3	0.1	
4	0	

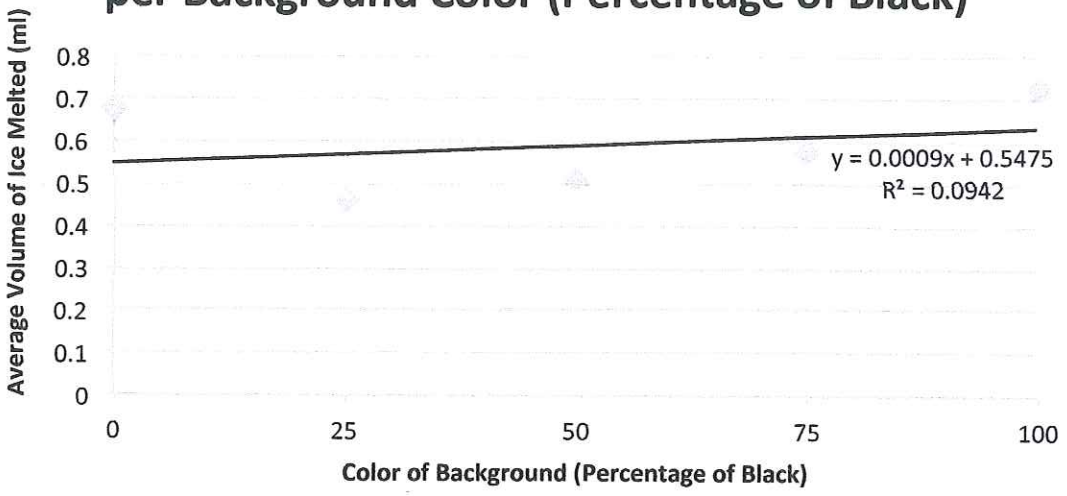
WATCH sig figs.

25% Black Paper		
Trials	Amount of Melted Ice	Average
1	0	0.05
2	0	
3	0.1	
4	0.1	

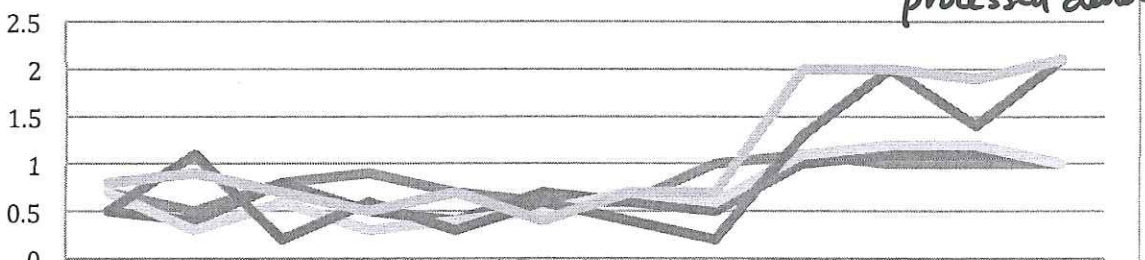
0.1
0.2 → 0.6 Avg.
0.8

White Paper		
Trials	Amount of Melted Ice	Average
1	0	0
2	0	
3	0	
4	0	

✓ Average Volume of Trials of Ice Melted (ml) per Background Color (Percentage of Black)



Processed Data for Ice Lab ← This IS NOT processed data!



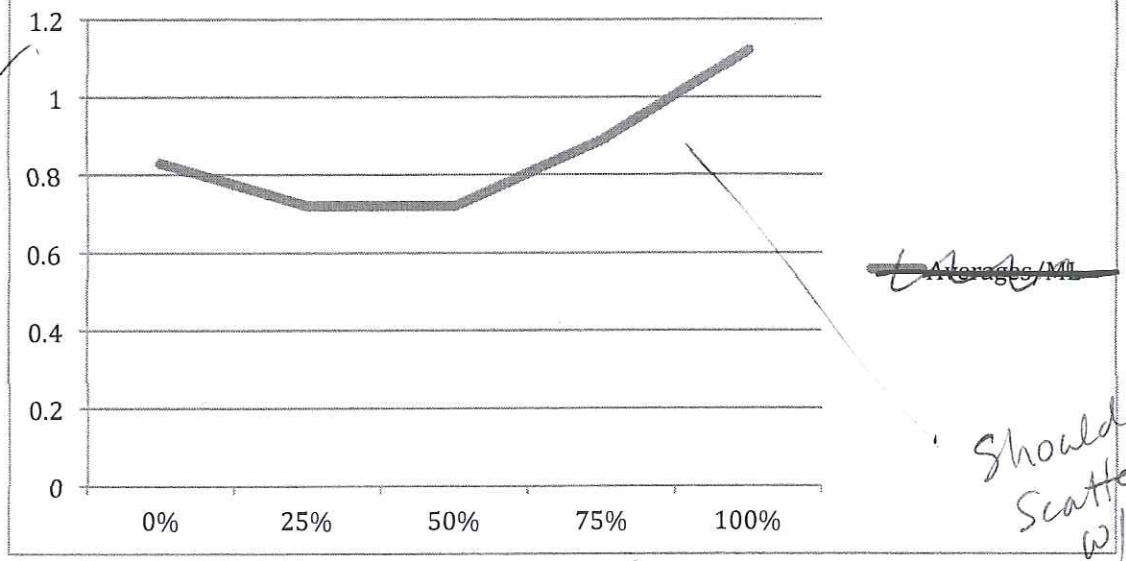
ML ?

VERY hard to interpret

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8	Trial 9	Trial 10	Trial 11	Trial 12
0%	0.7	0.5	0.8	0.9	0.7	0.6	0.6	1	1.1	1	1	1
25%	0.5	0.4	0.8	0.5	0.4	0.7	0.6	0.5	1	1.1	1.1	1
50%	0.7	0.3	0.6	0.3	0.4	0.5	0.7	0.6	1.1	1.2	1.2	1
75%	0.5	1.1	0.2	0.6	0.3	0.6	0.4	0.2	1.3	2	1.4	2.1
100%	0.8	0.9	0.7	0.5	0.7	0.4	0.7	0.7	2	2	1.9	2.1

Show evidence of processing!

Averages of Trials /ML ← More descriptive!



UNITS?
AXIS labels?

Should be scatter plot w/ line of best fit!

Evaluation

Strengths / Weaknesses	Significance	Improvements
Only four trials per background colour.	The data is quite vague, meaning it's not as accurate as it could be. Because of this, the averages for 50% and 75% were the same.	Have more trials for each background to have more accurate data.
Inefficient measuring tool.	Because the measuring tool for the lab was not very precise, all of my data is rounded to the nearest 0.1 mL.	Use a measuring tool with more indicators to measure the exact amount of milliliters.
The top of each beaker was not covered by the background.	While it may have affected the data and how fast the ice melts in the different circumstances, because the variable did not change between experiments, the correlation and differences between each trial should be the same.	Cover the top of the beaker with the appropriate background.
All of the control variables included within the lab (distance between lamp, size of ice cube, etc.) were maintained through each trial.	The significance of this is that the data does not differ significantly from one trial to the other, as the same circumstances are met (other than, of course, the independent variable). This includes, for example, the temperature of the room, which is the same for each trial as they were conducted at the same time.	N/A
Certain aspects were unable to be controlled, such as the length of time the ice had been frozen for.	If one ice cube was frozen for a longer period of time than another, then the speed of it would not be consistent, as the less frozen block of ice would melt faster.	The best way to actually control all variables is to plan ahead and freeze the ice cubes by myself for a specific length of time.

← VERY NICE + Specific

Strengths / Weaknesses	Significance	Improvements
I conducted the experiment individually without others conducting the same experiment around me.	While this has little significance to my own data, if comparing it to the rest of the class, I may have conducted it slightly differently to someone else, which would mean the data would be incomparable.	If possible, conduct the experiment with everyone else at the same time, to avoid a difference in the conduction of the lab.

too general

Strength/Weakness	Significance	Improvement
The procedure given for completing the Lab was very simple.	This made it easy to carry out and make sure all of the variables were in place.	Find a way to keep certain variables more consistent and accurate, such as the heat of the lamp and distance of the lamp from the ice.
The data recorded appears to be inaccurate based on the theory of albedo.	The significance of this is that the data as a result, is not very useful.	Find a way to control the variables to a further extent, in order to achieve more accurate results.
The lamps were not the exact same distance from the ice.	Because the lamps were not all at the same distance from the ice, it results in possible different levels of heat were applied to each cube. This results in inconsistent results due to different amounts of energy applied to each piece of paper surrounding the ice.	To not have multiple cubes melting at a time and to only use one lamp. This way it is the same lamp and the same distance for every part of the lab.

Strength/Weakness	Significance	Improvement
We got the ice before the start of each trial	The ice would still all be solid before each trial and not have already been sitting out before placed under the lights	No improvement needed
Allowed time for lamps to cool	If the lamps were still hot while going to the next trial it could have affected the ice in the way that it would melt faster or make the experiment unfair	No improvement needed
Different angles of the lamp	Might have caused less light to hit the ice containers if the angle was different	Make sure lamps are all facing the same direction and same angle so this would not be a possible affect
Have ice placed under lamps for longer period of time	By doing this more water would melt so when we took the measurements we could have more than 0.1ml and get a better idea in larger numbers	Would allow more water to melt off ice and would give us larger quantities and an easier chance to read the measurement

More please!

Discussion

From the findings of the experiment, a lot of connections can be made with the affects of albedo on the earth and climate change. The findings show that the darker the background color taped to the beaker is, the more ice that melts. In our experiment we used different colors of paper ranging from 100% black (no reflectivity) to 0% (high reflectivity). This fits with the concept of the albedo effect, because albedo is a measure of reflectivity of a surface. It is measured on a scale of 0 to 1, where 0 is an idealized black surface with no reflection, and 1 represents a white surface that has perfect reflection. The albedo effect when applied to the Earth is a measure of how much of the Sun's energy is reflected back into space. The concept of albedo in a bigger context basically tells you that the more albedo there is, the cooler it will be because the higher reflectivity will reflect the heat energy from the sun back into space, and the less albedo there is, the warmer it will be because the heat energy is absorbed. This is expressed in my results as the ice seemed to melt more when the background was black (less reflectivity/albedo) and less ice seemed to melt when the paper was white/lighter (more reflectivity/ albedo). This experiment can be the beginning of understanding the basic roles of albedo on ice, in situations in the world where ice is melting increasingly fast and helping us understand why this is happening.

Examples of high and low albedo would be in systems like the arctic or in forests and oceans. Albedo is higher in snow and ice climates as they are highly reflective, and they reflect the sun's heat/rays back into space; so when they melt, albedo drops. And Forests have a lower albedo than open land because they are more closed/dark so they have less reflectivity and thus they absorb the heat energy. Same with darker oceans, they absorb heat energy which warms the water — Oceans keep the earth warm since they absorb a lot of heat (approximately 90%); this warming increases water vapor, which acts as a greenhouse gas and helps keep temperatures within range. In relatively dark climate like oceans, about 90% of the heat is absorbed and 10% is reflected back into space, while in climates which are light such as with snow and ice, 10-15% of the heat energy is absorbed and the remaining 85% to 90% is reflected back into space.

great discussion

Overall, the Earth's albedo has a cooling effect (The term 'albedo' is derived from the Latin for 'whiteness'). Albedo can be applied to the world in many different ways; anything from what clothes you wear, to architecture to climate change. Some examples of everyday use of the concept of albedo is with you clothes in relation to the weather. In the summer, people tend to wear lighter colors because they reflect the suns heat and keep you cooler. Or buildings are generally finished in white, so that it allows the building to remain cooler. Now with climate change, the concept of albedo plays many factors in it.

Things that affect albedo vary. Some of these things include seasons, and human activity. In relation to seasons, albedo peaks two times a year, one is when the Antarctic sea-ice is at its winter maximum and the second one (which is bigger), occurs when there is snow cover over much of the Northern

Hemisphere. Then it's affected by human activity through deforestation, which increases albedo because it creates more open space which creates lighter patches of land (then the forest would have) which then increases the reflectivity of that area. Then burning wood and fossil fuels adds black carbon to the atmosphere. Some black carbon settles on the surface of the ice, which reduces albedo. Another thing that effects the albedo of the earth is clouds. Clouds have reflective qualities and contribute to the cooling affect of albedo, but also they contribute to warming. This is because, the clouds reflect sunlight which contributes to albedo's cooling effect, but they also consist of condensed water vapor which retains heat, thus warming. Clouds are an example of albedo going through a negative feedback process because increased cloud cover, an expected result of global warming, increases the reflection of solar radiation away from the Earth's surface, but it also increases the net long-wave radiation emitted downward from the same clouds back to the surface. Albedo can be both a negative and positive feedback depending on the situation. For example, an important positive feedback process is that of ice-albedo/snow-albedo feedback. This is a positive feedback climate process in which changes in the amount of area which is covered by snow, ice caps, glaciers or sea ice changes the albedo. This change in albedo acts as a reinforcer for the initial change is ice area. Cooling tend to increase ice cover and hence, the albedo which reduces the amount of solar energy absorbed and leading to more cooling. Though oppositely, warming tends to decrease ice cover and albedo, which then increases the amount of solar energy absorbed, then leading to more warming.

Also, another example of positive feedback with ice albedo is how melting ice cause more ice to melt. Summer is warmer than winter but it becomes even warmer as the ice changes and melts. This happens because as summer comes, the sun gets higher in the sky each day and the weather gets a little warmer. Warmer temperatures melt the snow which exposes bear sea ice. Pool of melted water from on the ice and cracks called lead break the ice into spirit pieces. The exposed ice is darker in color than the snow, and so are the pools and cracks. And where the ice ha melted, dark ocean water is exposed. Since all these changes make the surface darker, the albedo is lower and more solar energy is absorbed and less is reflected; holding onto this energy causes more ice to melt, which then lowers the albedo, causing more energy to be absorbed and more warming. This is a normal process, except it changes as the earth's climate changes. And the heat that is held causes more and more ice to melt as the earth temperature is rising as more greenhouse gases are released into the atmosphere. Plus, there is more time during the summer for the compounding cycle of melting ice, lowering albedo and trapping more solar energy, and causing more ice melt. And there is less time in the winter for ice to reform so the heat stays trapped and is constantly melting the ice.

Albedo relates to climate change in the fact that nearly all the ice on the planet is melting and as the white surfaces decrease in area, less energy is reflected back into space, thus causing the earth to warm up more. The loss

of Arctic ice is of particular concern — the ice is disappearing quite fast; not only is albedo decreasing, but the loss triggers a positive feedback. By exposing the ocean surface to sunlight, the water warms up. This melts the ice from underneath, while man-made CO2 in the atmosphere warms the surface. Also, while humidity increases, so does water vapor which is a powerful greenhouse gas. Therefore more ice melts, which exposes more water, which melts more ice from underneath. This loop fuels itself. It is also a good example of a positive feedback. Increased water vapor also has another effect, which is to increase the amount of cloud, and clouds can increase not only albedo, but also warming.

Sources:

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http://www.windows2universe.org/earth/polar/ice_albedo_feedback.html

Should be @ very end of Lab

Complete Bibs please?

PROSE please!

pect of Context	Notes
nvironmental	This lab shows the affects of albedo. Albedo being the proportion of light reflected by a surface. Albedo varies on a scale from 0 – 1. 0 meaning black (perfect absorber) and 1 meaning white (perfect reflector). The different percentages of black in the paper are meant to replicate this affect as it would pertain in the real life situations
Environmental	Albedo can be directly exhibited when looking at sea ice or polar ice caps. The reason they are able to stay frozen for so long is because sea ice has an albedo of 0.7 compared to other earth surfaces such as the ocean surface. This means it's able to slow down the melting process by reflecting up to 70% of the solar energy. However as the sea ice does begin to melt, small pools are formed, lowering the albedo and speeding up the melting process. As ice caps melt more and more, the white surfaces decrease in area, less energy is reflected into space, and the Earth will warm up even more.
Trends/Patterns	The trend in the data the data collected is very weak. There is almost no correlation. It almost exhibits that of a parabola. This could be a result of human error setting up any of the many variables, such as the heat or distance from the light source. According to the theory of albedo, the fully white piece of paper should have produced the least melted ice, due to white being the perfect reflector. However, the results show the 0% black paper being the second highest in melted ice. This must be a result of some error with the variables.

Conclusion

The aim for this experiment was to see if different colors of background affected how much ice melts over the span of five minutes. The data that was collected does not establish a clear correlation between the colors of the paper affecting how much ice melts. This is because when the paper is 0% black or white the average had a lot of ice melting over time. This makes the data confusing because for the other colors of paper the darker the color or the highest percentage of black had the most amount of ice melting. In addition, by looking at specific data points they are all over the place. 50% black has low data points such as 0.3ml of ice melted but then it has high ones like 0.7ml of ice melted. Since there is a lot of ice melted and a little bit of ice melted it is hard to establish a clear correlation.

Then when looking at the graph none of the points touches the line of best fit. 0% black and 100% black are not even close to the line. 0% black's average makes it hard to establish a clear correlation looking at the graph. In addition, when looking at the numbers alone it is very high. These numbers for 0% black do not follow the slight trend that the graph has. This also makes it hard to establish a clear correlation.

The graph has a slight trend for the colors 25%, 50%, and 75% black. Each color goes up by a little under 1 decimal. Even though this trend is small it shows that the darker colors melt a little bit more ice than the lighter ones.

Overall, it is hard to establish a clear correlation between different colors of background affecting how much ice melts in the span of five minutes. Next time it would be beneficial to conduct more trials, start off with more ice to melt, and take more time melting the ice.

good conclusion!

Conclusion: Did data support hypothesis or not?

In conclusion, the data does generally support our hypothesis as the averaged results show a general increasing volume of water being melted, as the paper got darker and darker. However, looking at the raw data closely, the trend is not very apparent as the trials varied greatly with each level of darkness and results overlapped with each other from all different color levels. This is largely due to the inaccuracy of our experimental method and could be improved in a variety of ways. However, even with those flaws, the experiment does give a positive result as the ice-albedo effect is being supported.

Really?

Are you sure it was inaccuracies?

Why not processed?

TALK ABOUT SPECIFIC DATA PTS!